

CLAIMS

1. A drive for cooling fans in motor vehicles, the drive comprising a main cooling circuit (3) including a main cooler (4) and at least one secondary cooling circuit (5, 6), and a fluid friction clutch including driving and driven clutch members (9, 10) and a reservoir (17) for a viscous fluid, the reservoir (17) being limited by a separating member (18) and being connectable to a working chamber (19) by at least one first opening (20) in the separating wall (18), the working chamber (19) extending into a region between the clutch members (9, 10) in which torque is transmitted from the driving clutch member to the driven clutch member by the viscous fluid, and wherein the filling of said chamber with viscous fluid is controlled by a first control element (21) opening and closing the or each first opening (20) in the separating wall (18) depending on the temperature of the cooling air passing through the main cooler (4), **characterised in that** the drive further comprises at least one secondary cooling circuit (5, 6) including a temperature sensor, said temperature sensor being operatively connected to a control unit arranged to control a second control element (31), wherein the separating wall (18) comprises at least one second opening (30), the second control element (31) being arranged in the working chamber (19), the control unit moving the second element to open and close the or each second opening (30) in accordance with the temperature sensed by one of said temperature sensors, to control the filling of said chamber with viscous fluid, and wherein control of second opening (30) is not influenced by the first control element (21).
2. A drive according to Claim 1, wherein the first and second control elements (21, 31) are arranged on opposite sides of the separating wall (18).
3. A drive according to Claim 1 or 2, wherein the second control element (31) moves axially towards and away from the separating wall (18) to close and open the said second opening 30.
4. A drive according to Claim 3, wherein the degree of movement of the second control element (31) is proportional to the temperature sensed.

5. A drive according to any preceding claim, wherein the control element (31) is connected to the control unit by an actuation member (33, 57).
6. A drive according Claim 5, wherein the actuation member (33, 57) extends through a concentric bore of a drive shaft (11), and the control unit engages the actuation member (33, 57) extending from the drive shaft (11).
7. A drive according to according to Claim 5 or 6, wherein the control unit is rotatably arranged in a chamber (48) of a drum (43) driving the drive shaft (11), a working fluid flowing through the chamber (48).
8. A drive according to Claim 7, wherein the control unit is rotatably supported in the said drum (43) by a roller bearing (52).
9. A drive according to any of Claims 5 to 8, wherein the control unit comprises a piston and cylinder actuator, the piston being connected to the actuation member (57), and wherein the said piston comprises first and second surfaces, the first surface being subjected to a force of a biasing element (60), and the second surface being subjected to a force generated by an element (59) which expands with rising temperatures to open the or each opening (30).
10. A drive according to any preceding claim, wherein the control unit includes a magnet (38).
11. A drive according to Claim 10, wherein the magnet (38) is controlled by an electronic circuit (39), the temperature sensors (40, 41) forming part of said electronic circuit, and wherein the magnet (38) is moved to open said second openings (30) if either one of the temperature sensors detects a temperature above the said predetermined switching temperature.